

**REMARKS**

In view of the above amendments and the following remarks, reconsideration of the outstanding office action is respectfully requested.

The rejection of claims 1, 3-9, 18-23, 31, 33, 35-38, 41, 43, 44, and 52-54 under 35 U.S.C. § 112 (2<sup>nd</sup> para.) for indefiniteness is respectfully traversed in view of the above amendments.

The rejection of claims 1, 3-5, 24-29, 35, 36, 39, 41, 43-45, 47-51, and 53 under 35 U.S.C. § 102(b) as anticipated by Braun et al., "DNA-Templated Assembly and Electrode Attachment of a Conducting Silver Wire," *Nature* 391:775-778 (1998) ("Braun") is respectfully traversed in view of the above amendments and the following remarks.

Braun discloses a two-step procedure that allows the application of DNA to the construction of functional electrical circuits, where hybridization of a DNA molecule with surface-bound oligonucleotides is first used to stretch the DNA molecule between two gold electrodes, and the DNA molecule is then used as a template for growing a conductive silver wire.

However, Braun does not in any way teach or suggest a system or a device having a means for determining whether the one or more targets are in the sample as a result of the extent of electric conductance between the two electrodes of each assay set, as set forth in amended claims 1, 3-5, 35, 36, 43, 44, and 53 of the present application. (Support for the amendments to the claims and new claims 55-61 is found on page 8, lines 12-16; page 15, lines 5-14; page 16, lines 17-20; page 17, lines 22-26; page 18, lines 11-13, Example 27, and Example 28 of the present application.) In particular, while Braun may disclose that electrical measurements were made on the silver wire that was formed, there is no teaching or suggestion in Braun regarding any means for determining whether the one or more *targets* are in the sample or not as a result of the extent of electric conductance between the two electrodes of each assay set, as claimed by the applicants. Braun also fails to teach or suggest a method for assaying the presence or absence of one or more biological molecule targets in a sample, as set forth in amended claims 24-29, 39, 41, 45, and 47-51 of the present application. (Support for the amendments to the claims is found on page 7, lines 14-16 and 18-19; page 8, lines 12-16; page 15, lines 10-14; and page 17, lines 14-26 of the present application.) In particular, Braun teaches that the surface-bound oligonucleotides are

contacted with a solution that is *already known* to contain only  $\lambda$ -DNA. The  $\lambda$ -DNA is constructed precisely with a defined length and “sticky” ends to facilitate hybridization to the oligonucleotides and forms a bridge between the oligonucleotides bound to the electrodes, leading to the formation of a nucleic acid substructure for formation of a wire. This is far different than assaying *the presence or absence of* one or more biological molecule targets in a sample by contacting the assay device with a sample which *may or may not have* the target, as claimed by the applicant.

More specifically, Braun does not teach or suggest a “system for assaying one or more targets in a sample comprising: (a) an assay device having one or more assay sets at least one for each target to be assayed, each of the assay sets comprising at least two electrodes and a recognition moiety immobilized to one or more of the at least two electrodes...; (b) an electric or electronic module arranged and configured to measure electric conductance between the at least two electrodes of each assay set; (c) reagents formulated to deposit a conductive substance onto a complex formed between said recognition moiety and said target...; and (d) means for determining whether the one or more targets are in the sample as a result of the extent of electric conductance between the two electrodes of each assay set” as required by amended claim 1 (as well as dependent claims 3-5, 43, 44, and 55-59) of the present application. Nor does Braun teach or suggest an “electronic device for determining the presence or absence of one or more targets in a sample comprising: an integrated circuit comprising a first group of  $N_1$  conductors and a second group of  $N_2$  conductors, defining between them  $N_1 \times N_2$  junctions, each such junction being formed with an electronic module comprising two electrodes...; each pair of electrodes forming part of an assay set...; and means for determining whether the one or more targets are in the sample as a result of the extent of electric conductance between the two electrodes of each assay set” as required by amended claim 35 (as well as dependent claims 36, 41, 53, 60, and 61) of the present application. Braun also does not in any way teach or suggest a “method for assaying the presence or absence of one or more biological molecule targets in a sample” by providing an assay device having one or more assay sets at least one for each target to be assayed, each of the assay sets comprising at least two electrodes, contacting the assay device with a sample which may or may not have the target under conditions permitting binding of targets, if any, present in the sample to specific recognition moieties, contacting the assay device with a reagent to form a conductive bridge between the at least two electrodes, and determining the

conductance between the at least two electrodes, where conductance above a threshold conductance indicates the presence of a respective target in the sample while conductance below a threshold conductance indicates the absence of any targets in the sample, as required by amended claims 24-26 (as well as dependent claims 27-29, 39, 45, and 47-51) of the present application. Since Braun does not teach or suggest the claimed system or device that has the means for determining whether the one or more targets are in the sample as a result of the extent of electric conductance between the two electrodes of each assay set, or the claimed methods for assaying the presence or absence of one or more biological molecule targets in a sample by contacting an assay device with a sample which may or may not have the target, the rejection based on this reference is improper and should be withdrawn.

The rejection of claims 31, 33, and 52 under 35 U.S.C. § 103(a) for obviousness over Braun is respectfully traversed in view of the above amendments canceling the claims.

The rejection of claims 6-9, 18-21, 37, 38, and 54 under 35 U.S.C. § 103(a) for obviousness over Braun is respectfully traversed in view of the above amendments and the following remarks.

It is the PTO's position that it would have been obvious to one of ordinary skill in the art to duplicate the assay set of Braun to arrive at the present invention of a system comprising multiple assay sets, as claimed in claims 18-21, and 38, or a device, as claimed in claims 37 and 54. In addition, it is the PTO's position that it would have obvious to one of ordinary skill in the art to use metal particles other than silver which conduct electricity such as platinum or gold for the purpose of metallizing the bridge formed between the electrodes of Braun, as claimed in claims 6-9.

As already noted above, Braun fails to teach or suggest the present invention of amended claim 1, from which claims 6-9, 18-21, and 38 depend. In particular, no where in Braun is there any teaching or suggestion of a system for assaying the presence or absence of one or more targets in a sample comprising an assay device having one or more assay sets at least one for each target to be assayed, each of the assay sets comprising at least two electrodes and a recognition moiety immobilized to one or more of the at least two electrodes, an electric or electronic module arranged and configured to measure electric conductance between the at least two electrodes of each assay set, reagents formulated to deposit a conductive substance onto a complex formed between the recognition moiety and the target,

and means for determining whether the one or more targets are in the sample as a result of the extent of electric conductance between the two electrodes of each assay set, as required by amended claim 1 of the present application. Thus, Braun could not have rendered obvious the subject matter of claims 6-9, 18-21, and 38.

In addition, Braun does not in any way teach or suggest an electric device for determining the presence or absence of one or more targets in a sample comprising a microelectronic device, each pair of electrodes forming part of an assay set, and means for determining whether the one or more targets are in the sample as a result of the extent of electric conductance between the pair of electrodes of each assay set, as required by amended claim 37 (as well as dependent claims 54, 62 and 63).

Since Braun does not teach or suggest the claimed system or device that has the means for determining whether the one or more targets are in the sample as a result of the extent of electric conductance between the two electrodes of each assay set, the obviousness rejection based on this reference is improper and should be withdrawn.

In view of all of the foregoing, applicants submit that this case is in condition for allowance and such allowance is earnestly solicited.

Respectfully submitted,



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